



# The Guide Star



Mingo Creek Park  
Observatory

Newsletter of the Amateur Astronomers Association of Pittsburgh, Inc.

Founded June 9, 1929 by Chester B. Roe and Leo J. Scanlon

Website: [3ap.org](http://3ap.org)



Nicholas E. Wagman  
Observatory

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## 9/11/01

Birds of destruction flying on wings of despair  
 Controlled by contaminated craniums throbbing  
 With blood pumped by hearts full of emptiness  
 Diving into the nests  
 Of unsuspecting eagles  
 Leaving behind burnt feathers and shattered bones  
 Buried in straw and twigs  
 That once gave shelter to the highest nests in the  
 land

Fallen perches of a proud flock of hunters  
 Now surrounded by mourning doves  
 And all the nests in the forest vibrate  
 From the shockwave of the devastation  
 Sending the sparrows, finches, crows, hawks and  
 doves  
 To a common roost  
 Where they sing a chorus of hope and anger  
 Praying for peace  
 Yet calling for the talons of the mad mocking birds

Tom Reiland  
9/11-21/01



## AAAPERs Remember 9/11

**Tom Reiland:** It doesn't seem like it's been five years since 9/11. I went up to Wagman Observatory that night to try to clear my head of all the disgusting images of the day.

The bizarre thing about that night was the lack of air traffic, other than military and emergency aircraft. We had almost two weeks with little or no contrails. No blinking red or green lights. No landing lights. No noise from propellers or jet engines. No white streaks across the sky. The vehicles used as weapons were now grounded to prevent further destruction.

Observing is one of the three activities that I use to sedate myself on sad or depressing occasions. The others are listening to music, live or recorded, and writing. Here is something that I wrote that day and finished several days later:



**9/11 (continued)**

**John Cheng:** I remember that evening quite well.... Three of us set up on the hill: Tom Reiland, Tom Kelly and me. Not much was said and we kept some distance between us. The sky was wonderfully transparent and the Milky Way was easily visible.

My log says that in the space of a few hours I viewed M2, M11, M15, M30 and M57, Gamma Delphini, Uranus, and Neptune. Ed Moss stopped by to view M15, and I ended the night by observing NGC 6960, the Western Veil.

The only sound I remember was the comforting metallic noise of eyepieces being changed out.

Aristotle taught that perfection resided in the heavens and that it was only here on Earth that coming to be, and passing away, corruption and death were to be seen. Of course, he was wrong, but one can certainly see his point.



**The Almost Heaven Star Party**  
*by Chrissie Chojnicki*

Here's a long report on the Almost Heaven Star Party held by the Northern Virginia Astronomy Club on August 24–28 at the Mountain Institute Center in Circleville, WV. I traveled with fellow 3APers Richard Frye and Judy Maracevic. We only brought 1 scope; my 8" DOB and Richard's 2 binos.

We arrived Thursday at 1740 hours after a very long haul of the 23-foot travel trailer up and down the steep mountains of West Virginia. My poor Jeep! At the Mountain Institute, we had to pull over and shut the Jeep off since the transmission temp light came on. It took us 5.40 hours travel, which included 3 gas fill-ups as well as a food fill-up. We noticed about 45 other camps with tents, trailers, telescopes, and equipment scattered about in the field. It was a wonderful meadow nestled between the mountains; I haven't seen so many butterflies in years!!

After parking the trailer, we noticed a fellow astronomer named Dale Carey from Virginia who had his solar scope (Coronado) set up. I just had to go over and take a look. He had it right on Sunspot 904. At that time, there were 2 dark spots next to each other with a noticeable disturbance surrounding it. What a sight to behold!

After unpacking and cooking a light dinner, Judy, Richard, and I noticed the clouds rolling in. We still remained positive. Judy pulled out our GPS and noted

our elevation as 4,092 feet. Bob Novak and Bob Kalan walked by and talked to Richard for a few minutes. Night fell and so did our observing opportunities after listening to the Robo weather. Not good, so off to slumber.

Friday at 0330 hours, I woke up. I decided to go take a look outside. I gasped! The sky was clear and I could see everything; transparency was most perfect! I ran back into the travel trailer and woke up Judy and Richard. We used the 2 binos for our observing. Geeze...I could see so much via the naked eye. The dew was too heavy to use the DOB; cardboard tube and dew is not a good combination. At that time, I wished I had a different scope and a CCD for astrophotography. Someday! Observing lasted until almost dawn.

[The next day] the private and public tour of Green Bank Radio Observatory was awesome! We were up in the GBT Control room where the room is built of copper. There is an air-seal for the door. I was intrigued by the racks and racks of computer equipment. The tour included the mechanical and electronic labs where they build everything. The main radio telescope weighs in at 17 million pounds!!



So while we are there, we find out that Pluto was demoted . . . and during the drive-by tour-by-bus of the radio telescopes, they had a scale of the solar system. Pluto was right by the radio telescope with its flag at half-mast. Some of us got out of the tour bus and saluted the flag or hugged the flagpole while others took pictures of this scene as well as the radio telescope. We didn't arrive back to camp until 1800 hours.

Friday night observing turned into a "bad city night." The transparency was not great. We gave up around 2100 hours. We later found out that it cleared slightly around 0200 for about 2 hours or so. I was probably snoring then.....

***Almost Heaven Star Party (continued)***

Saturday, we were off and running to Spruce Knob Lake for a day of kayaking. Richard brought 2 skin-on-frame kayaks that he built. We had lots of fun there.

Saturday evening brought on the clouds and some rain. There were drawings for prizes at 7 p.m. Club member Ann Norman's name was called, but she wasn't there. Sorry . . . had to be there to win a prize. 3APer Jim Tooney's name was called! He won a fancy flashlight. Sky and Telescope's Bob Naeye, who gave a very interesting talk on the Cassini update, took pictures of Richard, Charlotte, and Jim! I wonder if they will be in the next issue?

When we came back, we visited with Bob Kalan and crew. Richard and Bob were checking out the new Teardrop trailer that Bob recently bought! Later that evening we visited with Charlotte and Jim. They stopped by our travel trailer. By then, it began to rain. Sunday, we packed up and made the trip back home.

Here are some more photos via ahsp website: <http://www.ahsp.org/photos.html>



**Black Forest Star Party**  
*by Dave Simms*

I was able to attend this weekend's Black Forest Star Party at Cherry Springs and thought you might enjoy a report. First the bad news, I didn't have a chance to pull the scope out of the truck because of bad weather. Both Friday and Saturday nights were cloudy with thunderstorms and, as an added bonus—tornado warnings! Woo-hoo!

But that didn't dampen our spirits! This was my first star party at Cherry Springs but will, hopefully, not be my last. Everyone there was, like us, really passionate about astronomy; and being with a group like that was invigorating for me. The park rangers had nothing but good things to say and the Central PA Observers were helpful and knowledgeable.

And while I did not win any door prizes (I had my eye on that Nagler eyepiece and the Coronado PST), I did attend all the lectures.

First up was Mark Deprest ("A Chariot, A Plough, A Big Dipper, or A Great Bear; The Myths and Stories of the Night Sky"), who talked about some of the mythology behind the asterisms and constellations we enjoy. I found this very cool since it combines mythology with

stargazing—a win-win for me. He discussed some well-known myths (Perseus and Andromeda) as well as some not so well known myths (at least to me).



The second speaker was Russ (sorry, can't recall his last name) from Denkmeier whose presentation was exposing myths about binoviewers. While educational, it was difficult to determine where the myth busting ended and the sales pitch began.



Dr. Darren Williams, the third speaker, discussed his research: "Oceans of Water on Distant Earth-like Planets". For me, this presentation had the biggest "wow" factor. A real scientist doing real science and discussing it! He was a dynamic speaker and his love of the

subject really showed through during his presentation.

Next up was Gerry Santoro's "The Lost Art of Astro-Drawing". I enjoyed this presentation since it rekindled my desire to begin sketching at the eyepiece.

The fifth presenter was Jerry Lodriguss. Jerry was educating us on "DSLR Astrophotography: Imaging and Processing". While I am not currently interested in astrophotography, Jerry was a great presenter and held my attention while clueing me into using my camera and Photoshop a bit better.

Sue French was keynote speaker. She presented "Obscure Sights for Black Forest Nights" which consisted of various small, medium, and large scope destinations that were a little out of the way. She leaned heavily on open star clusters, which were her favorites. I think we were all disappointed the weather did not cooperate enough to get a firsthand night sky tour with her.



So even though we were disappointed by the weather, I think a good time was had by all and I plan on heading to Cherry Springs again soon.

## ANNUAL JOINT MEETING WITH SSP OCTOBER 18, 2006

The annual Joint meeting with the Spectroscopy Society of Pittsburgh (SSP) and the AAAP will take place on Wednesday, October 18, 2006, at the Duquesne University Mellon Hall of Science. The Tech Forum Talk begins at 5:30 with Professor Richard Griffiths of Carnegie Mellon University discussing the origin of the X-Ray background, from data taken by the Chandra X-Ray Observatory, and the European Space Agency XMM-Newton satellite. The social hour and dinner follows and the main meeting begins at about 8:00 pm. Our speaker is NASA scientist Dr. Michael Zolensky, who will discuss the results of the STARDUST mission. The abstract for this talk follows:

### Preliminary Examination of the Comet Wild 2 Samples Returned by the Stardust Spacecraft

The sample return capsule of the Stardust spacecraft was successfully recovered in northern Utah on January 15, 2006, and its cargo of coma grains from Comet Wild 2 has now been the subject of intense investigation. This presentation will present the "final" results from the preliminary analyses that will have been performed. The period since spacecraft recovery has been sufficient to permit numerous analyses by over 200 researchers, and to permit some understanding of the following fundamental sample issues:

1. Comet nucleus composition, mineralogy, petrology, isotopic composition and grain physical properties
2. Sample variability
3. Type and degree of sample alteration by the collection process, and subsequent sample handling
4. Sample documentation and handling procedures
5. Comparisons to what was reported by the Deep Impact Mission to Comet Temple 1

Because of the overwhelming last minute calls to the SSP dinner coordinator last year, we will handle dinner reservations differently this year. Please call or email David F. Pensensadler, at 412.673.6797, or at [dfpens@comcast.net](mailto:dfpens@comcast.net) with your dinner reservation no later than Friday, October 13, 2006. Only your name, number of guests, including yourself, and any dietary restrictions need be included.

The AAAP has been participating in this joint meeting for over 20 years, where noted researchers and scientists in their respective fields have been brought in to discuss a wide variety of subjects on science, astronomy, and spectroscopy. Let's show the SSP that we appreciate this singular honor with a large turnout at this meeting. If you are only interested in the talks, you need not attend

the dinner. Just show up at the Mellon Hall of Science for either or both talks. The monthly SSP meeting notice will be sent to everyone on the AAAP membership list.

### Mercury Transit November 8

By Kathy DeSantis (borrowing from web research, list postings and email of esteemed members)

*John Cheng:* A very early heads up for Wednesday November 8th. Mercury will begin to transit the solar disk at 14:13 EST and will still be against the sun as it sets a bit after 17:00. The next Mercury transit will occur in May of 2016, so this might be the one to do...unless you're really into waiting. Some might recall that the Venus transit of 2004 attracted a fair collection of observers up at Wagman. The eastern end of the hill was loaded with optics and happy people. True, it wasn't Woodstock, but everybody was "high" so, I'll try observing Mercury from Wagman hoping to run into some members and take away a great memory, and because from home, the view would be terrible.

The transit will be an afternoon event, starting about 2PM local time and continuing right through our sunset. Because it's viewable from many locations, most web sites and books are publishing universal time. We'll have switched to Eastern Standard Time by then so the differential between universal and local times will be five hours. I believe only the west coast gets to view the whole event—all four contacts. We'll be able to time the first two, especially the second - and look for the "black drop" effect, which wasn't in evidence during the Venus transit. Bottom line, this is a good news, bad news event. The good: You don't lose any sleep. The bad: You have to skip a day of work. (Oh wait...that would be "good" too).

*Tom Reiland:* The greatest point of the transit will be during rush hour or dinner for many people. School won't be letting out until after it starts. The gates will be open at Wagman Observatory for anyone who might be interested in observing this event. I doubt that the average person will be able to get off work in time to see it. Sunset will be at approximately 5:10 p.m. EST. We could try to reschedule it for the weekend. Here are the transit times according to the Observer's Handbook converted to local standard time:

First Contact: 2:12:04 PM

Second Contact: 2:13:57 PM

Greatest Transit: 4:41:04 PM

Third and fourth contact not visible from here: (7:08:16 and 7:10:08 PM)

*Mercury Transit November 8 (continued)*

*Flacc:* I'm planning on having the Brashear open; weather permitting, Wednesday, mid-afternoon November 8 for the Mercury transit. It will be pretty low in the southwest. I believe first contact will be at about 2:13 PM EST at an altitude of 25 degrees, azimuth of 214 degrees. All are welcome to view, try photos, etc.--

*Al Paslow:* The thing we all need to remember is this is a RARE EVENT. I looked for the last one in 2003 and I can't remember why I missed it, clouds maybe, whatever. All of us who witnessed the great transit of Venus in 2004 remember what a grand spectacle that was! A good number of us congregated at Wagman where good friends met for the historical occurrence. I left home in Bethel Park, ran to McKeesport, grabbed Joe Begandy and headed out for Deer Lakes Park all before the transit occurred at sunrise. A number of members including Dave Smith, Larry McHenry, Ed Moss, George Guzik, Flacc and others were there, awaiting this amazing sight. The sky grew clear and darn, there it was, **Venus transiting the morning sun right in front of all with no clouds!!** Talk about amazing fortune! I was so happy with the images I took of the transit that I made copies and had given them away to the members of the Mingo Observatory Committee, family and friends. Overall, the experience was a total success! OK sure, within a half hour after the event the skies returned to typical muck; but the fact remains during the transit, they were great. I even got friends in Arizona upset, (because the transit wasn't visible there). I was conversing with famous telescope maker, John Gregory, at the time (inventor of the Gregory Maksutov) who summed it up by saying "wow...you dog!" It 's ok; I sent the best transit images to John anyway in Dripping Springs, Texas for feeling so left out. All right, Mercury transits happen more frequently than only once in every 120 years, and will not be as impressive due to the small size of the planet but this is the last one for quite a while. I'll see you at Mingo for this one. Tell sun gods not to hide this November and be in peace until then!

*Kathy DeSantis:* As of September 21, Mingo will be open for members, with Associate Director Al Paslow and committee members Kathy DeSantis, Laura Rhodes, and Elizabeth Ann Cauldwell planning to be there. If guests stop by, they will be welcome. Should we get some additional volunteers, we may consider taking on the tasks of inviting the public. Mingo, by the way, has its last of the season, regularly scheduled star party that Saturday, November 11. Included here, data and web addresses for you to check out. This could be something to do on a weeknight, which does not require folks to stay out late when they have to get up early in the morning.

Check out this website:

<http://sunearth.gsfc.nasa.gov/eclipse/OH/transit06.html>

There is an invitation for amateur astronomers to collect/submit data to A.L.P.O. (Association of Lunar and Planetary Observers) Mercury Rise and Set from Naval Observatory for PGH

[http://aa.usno.navy.mil/cgi-bin/aa\\_mrst.pl](http://aa.usno.navy.mil/cgi-bin/aa_mrst.pl)

Web research has yielded: Mercury is only 1/194 of the Sun's apparent diameter. A telescope with a magnification of 50x to 100x is recommended to watch this event...with adequate filtration to ensure safe solar viewing. "Amateurs can make a useful contribution by timing the four contacts at ingress and egress. Observing techniques and equipment are similar to those used for lunar occultations. Since poor seeing often increases the uncertainty in contact timings, an estimate of the possible error associated with each timing should be included. Transit timings and geographic coordinates of the observing site (measured from a topographic map or GPS) should be sent to Dr. John Westfall ([johnwestfall@comcast.net](mailto:johnwestfall@comcast.net)), A.L.P.O. Mercury/Venus Transit Section, P.O. Box 2447, Antioch, CA 94531-2447."

Later, John Cheng recommended looking for the "black drop". Further research yielded:

Observing the November 1999 Transit of Mercury:

<http://www.lpl.arizona.edu/~rhill/alpo/transitstuff/transit061109.html>

Observing the 2003 Transit of Mercury

<http://www.lpl.arizona.edu/~rhill/alpo/transitstuff/transit2003.html>

Black Drop Effect: To simulate the "black drop effect", pinch your thumb and forefinger together against a bright background and observe the ligament of contact that appears to form. There are various interpretations of its cause.

<http://www.transitofvenus.org/blackdrop.htm>

More on the "black drop effect":

<http://metaresearch.org/home/Viewpoint/blackdrop.asp>

<http://home.hetnet.nl/~smvanroode/blackdrop.html>

[http://arxiv.org/PS\\_cache/astro-ph/pdf/0310/0310379.pdf](http://arxiv.org/PS_cache/astro-ph/pdf/0310/0310379.pdf)

Videos of the 1999 Transit of Mercury:

<http://telescopemaking.org/transit.html>

## STARS IN THE NIGHT SKY NETWORK

By Chrissie Chojnicki, Night Sky Network Coordinator  
for AAAP

**The Night Sky Network** is a nationwide coalition of amateur astronomy clubs bringing the science, technology, and inspiration of NASA's missions to the general public. The success of the Night Sky Network rests on the shoulders of its member clubs. Since last February over a thousand events have been logged! Many of the events logged were hosted by "Stars of the Night Sky Network"; member clubs that have logged four or more public astronomy events in the past six months.

Astronomy clubs such as AAAP regularly share their knowledge, time, and telescopes with their communities. Below are the clubs who have logged four or more public astronomy events, etc. in the past six months (since March 21, 2006) using NASA Night Sky Network resources. 3AP now holds 11<sup>th</sup> place! Congratulations to all our current NSN participants in our club! Next year, we hope to have more 3AP members trained on all the toolkits! For more information on the Night Sky Network, please see the following link: <http://nightsky.jpl.nasa.gov/>

Events ▼	Club Name	State
70	<a href="#">Santa Barbara Astronomical Unit (Website)</a>	CA
67	<a href="#">Astronomical Society of Northern New England (Website)</a>	ME
63	<a href="#">Westminster Astronomical Society, inc. (Website)</a>	MD
58	<a href="#">Southwest Florida Astronomical Society, Inc. (Website)</a>	FL
37	<a href="#">San Antonio Astronomical Association (Website)</a>	TX
24	<a href="#">Barnard-Seyfert Astronomical Society (Website)</a>	TN
21	<a href="#">Von Braun Astronomical Society (Website)</a>	AL
18	<a href="#">National Capital Astronomers (Website)</a>	MD
16	<a href="#">Morgan County Observatory Foundation (Website)</a>	WV
16	<a href="#">Phoenix Astronomical Society (Website)</a>	AZ
15	<a href="#">Amateur Astronomers Association of Pittsburgh (Website)</a>	PA

## Topic of Next Meeting: Pittsburgh and Time Travel

By Ann Norman

At the next general meeting, Friday, October 13<sup>th</sup>, at 7:30 at the Carnegie Science Center, our own Ken Kobus will discuss temporal anomalies and how Pittsburgh helped bring order to the universe.

Telling time was not always the simple matter that it is today. Before rail travel, most people used apparent solar time—a sundial—to set their clocks. As railroads expanded in the nineteenth century, a standard system

of timekeeping became essential to prevent railroad cars from crashing into each other. At first, a standard railway time existed alongside official city times. In fact, there was a period when Pittsburgh had *three* time zones. It was a long time before the mess was sorted out and Pittsburgh and Allegheny Observatory played a central role in that process.

So, set your chronometers. We meet at the Science Center at 7:30, sharp, Eastern Standard Time! (Those of you still using sundials are going to miss a great lecture!)

## Kevin Brunelle Astrophotography Contest

By Dave Conte

Plan now to enter the Kevin Brunelle Astrophotography Contest! Dave Smith is the Chairman, leader, chief boss, etc. for this year.

The 2006 Brunelle Astrophotography Contest is November 10!

Once again, there are three people serving as co-coordinators of the contest: Dave Conte, Dave Smith and Mark Arelt. We are looking for photos, digital images and slides of astronomical objects. Peruse your images from this past year and choose your best to compete for fame, honor and prizes. (See contest rules below to decide what qualifies.) As always, the contest will be held at the November AAAP meeting, which will be Friday, November 10 at the Carnegie Science Center. The deadline for entry submission is 10 days before the meeting, October 31.

Please get your entries submitted in one of the following ways:

1. Hand them to Dave, Dave or Mark at the Friday, October 13 AAAP meeting 7:30 p.m. at the Carnegie Science Center
2. Mail them to Dave Conte at 112 Bower Dr., Sewickley, PA 15143-8412
3. E-mail them to Dave Conte at [allybiz@verizon.net](mailto:allybiz@verizon.net)
4. Please include your name, your telephone number, the category for each entry, and the titles of your images with your entries

Digital images (JPEG, GIF, TIFF) are easiest for us to work with. Mark Arelt will be happy to scan your slides or negatives into a digital format for projection. Please allow extra time for him to do this.

If you have questions, contact Mark Arelt, [diapsdia@earthlink.net](mailto:diapsdia@earthlink.net) 412/835-6806; Dave Conte, 412/366-4846; or Dave Smith, [davesmithphoto@aol.com](mailto:davesmithphoto@aol.com) 412/390-0870.

### Contest Rules

1. The contest is open to all active members of the AAAP
2. The contest date is the November 10 meeting of the AAAP. Entries will be viewed and judged by all AAAP members present at this meeting
3. All images entered must be originally captured by the contestant
4. Entries are limited to images concerning areas of interest within the AAAP
5. Images may be submitted as 35mm transparencies or negatives, photographic

- prints, or as digital media (in formats accepted by the AAAP Audio-Visual Committee)
6. Only images taken since the date of the previous contest deadline (November 8, 2005) are eligible.
7. There are 3 categories:
  - a. Astronomical images taken with optics of focal length no greater than 150mm
  - b. Astronomical images taken with optics of focal length greater than 150mm
  - c. Images of atmospheric phenomena
8. No more than 5 entries per contestant per category are allowed for each contest.
9. Entries must be received by the contest coordinator no later than 10 days before the contest date.
10. Entries will be judged for 1st, 2nd, and 3rd place in each category, with each voting member assigning points respectively (3, 2, and 1). The entry with the highest total number of points in each category will be declared the winning entry, and will be eligible for prizes. Entries that place 2nd and 3rd in total points in each category will be recognized by the AAAP.



Cignus by Mark Arelt



Andromeda Group of Galaxies By John Pane

## Forums

By Craig Lang

The forums that have been setup on the 3ap.org server are at: [www.3ap.org/forums](http://www.3ap.org/forums). The easiest way to describe a forum is to say that it is a discussion based website that collects together these discussions under topic headings. This is what makes it great for things like the Special Interest Groups (aka SIGs).

Let's say that there exists a group of club members who have a passion for solar observing. They can post under the "Solar Observing" category anything pertaining to solar observing. Experienced members can post tips, not-so-experienced members can ask questions, and the discussions are kept in threaded format for future reference. The discussions occur in this forum separate from the other forum topics. The listserver, the application that we are currently using to distribute these emails is not well suited for something like a SIG. There are many people on the list and there are some that would care not to receive emails about a particular subject. The forums allow the ability to pick and choose which topics you care to pay attention to and participate in, whereas this listserver is an all or nothing type of delivery.

As many members will remember me saying in the past: the forums are best used for discussions that would bog down the listserver and should be perfect for use by the SIGs.

Take a moment to review the presentation slides for the forum from a 2005 meeting... [http://www.3ap.org/secureL1/presentations/forum\\_intro.pdf](http://www.3ap.org/secureL1/presentations/forum_intro.pdf)

If you haven't signed up for an account on the forums, feel free to do so soon. All you need to join in the forum discussions is to be a paid-up AAAP member and have internet access. Be sure to pick a user name that identifies you so we all know each other in the forums and use the email address that you gave when signing up for the club. A good example of a forum thread can be found there under the "Double and Variable Star Observing" section with the heading of "Good Winter Doubles?"

## Guide Star online notification

By John Mozer

The web version of the Guide Star will be available on the 1st or 2nd of each month. Starting with this issue, notifications of it being available via the website will no longer be sent. Please assume that it will be available by the 2nd. If circumstances arise that it will not be posted by the 2nd, a notice from [it@3ap.org](mailto:it@3ap.org) will be posted on the general listserver.

## Ringside at the Pluto Smackdown in Prague

By Eric Mamajek

### PLUTOGUE

I voted for the International Astronomical Union (IAU) resolution that effectively "demoted" Pluto as a planet. Don't hate me. What I have heard from some people since I returned from Prague is "How could you do such a thing?" You would think from the media coverage that astronomers killed and roasted the cartoon dog on a rotisserie, rather than simply shift a AAAA weakling "planet" into a AAA powerhouse "dwarf planet". Here I want to share some observations from the meeting.

### THE MOTIVE

As is probably well known among astronomers both pro- and am-, the pace of discovery of large ice balls orbiting the Sun beyond the orbit of Neptune has been accelerating. Over 1000 Trans-Neptunian Objects are now catalogued. Everything was fine with Pluto being a planet, until 2003 UB313 (formerly, unofficially "Xena", now officially "Eris") was discovered a few years back. The latest measurements suggest that Eris has a marginally larger diameter (2400+-100 km) than Pluto (2306+-20 km). If Pluto is a planet, then why not 2003 UB313? And what is the minimum requirement to join the "planet" club? Surprisingly, there was no official definition of what constitutes a "planet"! The issue came to a head when it was unclear which IAU committee should be charged with the object's nomenclature, and which rules should apply to it. The outgoing IAU president, Ron Ekers, made it clear that "some" planet definition resolution had to be passed at the 2006 IAU meeting. It would be embarrassing for the group to let the issue go unresolved before the next IAU General Assembly (GA) in 2009.

### HOW MANY ASTRONOMERS DOES IT TAKE TO...

A few years ago, a previous committee made up of 19 members of IAU Division III (Planetary Systems Sciences) had tried, and failed, to reach a consensus on defining a "planet". The sticking point was allegedly a "group of 6" - mostly made of dynamicists. The dynamicists were unhappy with a "what"-only definition of a planet (i.e. properties intrinsic to the object), and insisted that a "where" clause (i.e. including the dynamical nature of the object's neighbors in the definition) needed to be included. As the previous committee did not reach a consensus, this year the IAU executive committee appointed a leaner, seven-person "Planet Definition Committee" to present a proposed definition that would, hopefully, pass a vote by the IAU General Assembly at the 2006

Prague meeting. The committee was chaired by Harvard professor emeritus, Owen Gingerich (the leading astronomy historian in the solar system), and met for a day and a half in Paris earlier this year to iron out a proposal. Out of the ashes of the previous committee's findings came the starting point for the new committee's definition of planet: roundness due to self-gravity.

### WEDNESDAY AUG 16: NO ICE BALL LEFT BEHIND

The committee's draft resolution was made public on August 16th, and the first draft of Resolution 5 is still on-line at:

[http://www.iau2006.org/mirror/www.iau.org/iau0601/iau0601\\_resolution.html](http://www.iau2006.org/mirror/www.iau.org/iau0601/iau0601_resolution.html).

The first bullet reads: "A planet is a celestial body that (a) has sufficient mass for its self-gravity to overcome rigid body forces so that it assumes a hydrostatic equilibrium (nearly round) shape<sup>1</sup>, and (b) is in orbit around a star, and is neither a star nor a satellite of a planet. (Footnote 1: This generally applies to objects with mass above 5e20 kg and diameter greater than 800 km. An IAU process will be established to evaluate planet candidates near this boundary)."

Bullet #3 was meant to satisfy the Pluto-huggers: "We recognize Pluto to be a planet by the above scientific definition, as are one or more recently discovered large Trans-Neptunian Objects." To confuse matters, the proposal had three types of planet category: (1) ALL of the round, Sun-orbiting bodies were considered "planets", (2) Pluto and the trans-Neptunian planets were called "plutons", and (3) "planets" were split into two descriptive categories: "classical" (the biggest eight) plus "dwarf" (Ceres, Pluto, Charon, 2003 UB313). Hence, Ceres was a "planet" and a "dwarf planet", while 2003 UB313 was a "planet", "dwarf planet", and a "pluton". The resolution would have instantly made a 12-planet solar system, and the press splashed the proposed "new solar system" worldwide, with some falsely claiming that this was the final resolution.

On his website and in a Aug. 16th New York Times editorial, Michael Brown (discoverer of 2003 UB313) called the proposal "No Ice Ball Left Behind" - and for good reason. Along with the draft resolution in the IAU meeting newsletter "Nuncio Sidereo" Volume II was a list of twelve "additional planet candidates" that it was claimed might eventually pass muster as planets in the future (including asteroids Vesta, Pallas, Hygiea, and the KBOs Sedna, Orcus, Quaoar, Varuna, & Ixion). Within a decade there could be dozens of "planets"! Hygiea? Orcus? Ixion? This was probably the first time that most of the astronomers present had even heard of many of these bodies! If this resolution passed, it would have been the last IAU meeting where all of the attendees could actually name the planets!

### THURSDAY AUG. 18: FIRST TOWN HALL MEETING

The first opportunity for "the masses" (i.e. the IAU meeting attendees) to publicly criticize the draft resolution was on Friday, August 18th. Committee member Richard Binzel (MIT) justified the "what" definition of planet (body orbiting the Sun, "roundish" due to self-gravity) by stating that other celestial bodies were defined by "what" they were, rather than "where" (i.e. a star is a self-luminous body powered by nuclear fusion, but we do not define it by whether it is in e.g. a Galaxy, cluster, etc.). The idea of a physically motivated definition (including gravity) seemed to please most, rather than an arbitrary "line in the sand" dividing line by e.g. radius or mass. But it took no time for objections to start flying. How useful a test is "roundness" if we can't even quickly tell whether the twelve "candidate planets" (e.g. Vesta, Pallas, Varuna, etc.) are in a hydrostatic equilibrium shape? How could the roundness criterion be applied to extrasolar planets? Astronomers started presenting plausible future scenarios where the definition would break or be inapplicable. One astronomer proposed that an easily measured quantity like absolute magnitude should be the "planet" criterion. Two astronomers (both dynamicists, I believe) independently stated that planets "dominate their zone", and one of them suggested that the terms "dwarf planet" and "planet" should be delineated dynamically.

Throughout the discussions, I had the queasy impression that the various senior astronomers associated with the committees/divisions/etc. were not all on the same page as to what the resolution actually meant. The most memorable scenes from this Aug. 18th meeting were (1) boisterous clapping at the notion to get rid of the term "pluton" (almost universally hated), and (2) a straw vote on how many of the IAU members liked the resolution (only about one-fifth liked it). It was fairly obvious that the draft resolution probably wouldn't pass at the GA.

### FRIDAY AUG. 19: THE DYNAMICISTS STRIKE BACK

On Friday, a group of dynamicists presented an alternative planet definition resolution at a meeting of ~100 members of IAU Division III (the division previously charged with defining "planet", which failed to reach a consensus). The alternative resolution included the criterion that a planet "is by far the largest object in its local population (1)", where footnote (1) stated that the "The local population is the collection of objects that cross or close approach the orbit of the body in consideration". Pluto, Charon, Ceres, and 2003 UB313 would be "dwarf planets". The alternative resolution omitted any mention about "orbiting the

Sun" (perhaps unintentionally?), included the "roundness" criterion, and also included a useful one-line bullet to take care of the high-mass end of the planet spectrum as well: a planet "does not produce energy by any nuclear fusion mechanism". A straw poll of the ~100 Division III members suggested that roughly 1/3 liked the original resolution, and 2/3 favored the alternative resolution.

### TUESDAY AUG. 22: TWO MORE TOWN HALL MEETINGS

The unpopularity of the executive committee resolution (with 12 planets), and the results of the Division III Friday meeting, led the planet definition committee to heavily rewrite Res. 5 over the weekend. The committee split the resolution in two: Resolution 5 would define "planets", "dwarf planets", and "small solar system bodies", and Resolution 6 would explicitly call Pluto a "dwarf planet" and declare it the prototype of a new class of dwarf planets called "plutonids". The revised Resolution 5 and new Resolution 6 were presented to astronomers at a morning town hall meeting on Tuesday. The new Resolution 5 defined a planet by the "roundness" and "orbiting the Sun" criteria, and subdivided planets into "classical" (the elite 8) and "dwarf" (Pluto and the others). The classical planets are the "dominant objects in their local population zones", while dwarf planets are not. In this terminology, Pluto would still be a "planet", but a "dwarf planet".

Between the morning and evening meetings, the committee had apparently given up any attempts to try to define what constituted a planet around another star, and changed the phrase "is in orbit around a star" to "is in orbit around the Sun". In the evening session, a dynamicist stood up and read a statement by Michael Brown pleading that the definition of planet needed to include a dynamical criterion. Seeing as MB arguably had the most to lose by this action (the objects that he co-discovered would be "dwarf planets", not "planets"), this seemed to carry some weight with the audience.

At the morning meeting, it was clear that "plutonid" also was unpopular, mostly because "-nid" made it sound like a meteor shower. At the evening meeting, the draft of Resolution 6 contained a list of suggested names for the Pluto-like dwarf planets. This included plutoids, plutonoids, plutians, Tombaugh objects, and Tombaugh planets. None of them were terribly popular.

### THURSDAY AUG 22: THE G.A. VOTE

On Thursday, the day of the General Assembly, media were everywhere in the Congress center. At the GA, new IAU members (including myself) were inducted,

and the names of deceased members were displayed, followed by a moment of silence. Topics of "scientific" interest were to be voted on by the GA in the form of resolutions. Yellow voting cards were passed out to the members. The final version of the "planet definition" resolutions were published in the IAU newsletter, and both Resolutions 5 and 6 were further subdivided into two sections each. The final text of the resolutions can be found on-line easily, so I won't repeat it here. One gets the impression that the executive committee divided Resolutions 5 and 6 into "A-parts" that they were pretty sure would pass by a majority (so that the IAU would not "break camp" without some form of planet definition), and "B-parts" that were more controversial, and might not pass. Indeed, both 5A and 6A passed, while 5B and 6B failed.

While the "Tuesday" drafts included the phrase "dominant objects in their local population zones" in the planet definition, somehow by Thursday the final resolution 5A had the phrase "cleared the neighborhood around its orbit". It is not clear why this change was made, as I suspect most people would prefer the former phrasing. Resolution 5B was essentially identical to 5A, except for a slick difference: "planet" itself was not defined! Resolution 5B was to revise 5A by replacing the word "planet" with "classical planet", in effect making "planets" of \*all\* "classical planets" and "dwarf planets". This minor rewording completely changed the character of the resolution, and would have led to the originally proposed 12-planet solar system (which would likely become dozens in the near future). During the voting on the resolutions, Jocelyn Bell (discoverer of pulsars), did an amusing job of trying to explain exactly what the resolutions meant. She set up a table with a balloon (representing the 8 non-controversial planets), a stuffed Pluto doll and a box of cereal (to represent Ceres) to represent the dwarf planets. She also moved the objects back and forth from under an umbrella to clarify whether the objects would be considered "planets" or "classical planets", etc.

Roughly 400 IAU members voted on the resolutions. Resolution 5A passed by a wide margin, with few "No" votes. No official tally was taken, although afterwards Virginia Trimble (who tallied the vote) told me that she counted 22 "No" votes, and no one bothered counting the huge number of "Yes" votes. Resolution 6A, stating the Pluto is a dwarf planet and the prototype of a new class of objects, passed (237 Yes, 157 No, 30 abstentions). Resolution 6B, calling this new class "plutonian objects", just narrowly failed (183 Yes, 186 No).

### EPLUTOLOGUE

I voted with the majority for all four resolutions. My feeling was that while Resolution 5A was clearly not perfect, it was better than what had been first proposed, and would settle the issue on the planetary status of Pluto and 2003 UB313 in a way that I thought most astronomers could live with. Resolution 5B would

have opened the floodgates, and every round lump of ice from here to the Oort cloud would have been elevated to "planet" status, and (in my opinion) cheapened the word. I liked the idea of calling Pluto the prototype of a new class of trans-Neptunian dwarf planets (Resolution 6A), but I disliked the suggested name ("plutonian objects"; Resolution 6B). From the suggestions that I heard, "plutonoid" was probably the least repulsive to my ears.

Owen Gingerich, who chaired the planet definition committee, gave a talk at Harvard in mid-September. He is clearly unhappy with the wording of the passed resolution, as I suspect many people are. He is still a big proponent of the "what" definition (roundness, and orbiting the Sun), and personally would have liked to have seen the term "planet" applied to the smaller bodies, with the term further subdivided into "Cerian" and "Plutonian" planets. Owen reminded his audience that asteroids were once considered bona fide "planets". The first four asteroids (Ceres, Pallas, Juno, & Vesta) were discovered in quick succession in the early 1800's and called "planets". After a four-decade discovery drought, many more started being found after 1845. Only then did data tables of the day start considering them "minor planets".

There have been complaints that probably only about 5% of the world's astronomers actually voted on the resolution, but judging by the margin by which it passed (about 95% in favor), I doubt it would have mattered how large the group was. I have seen editorial comments with the allegation that the "demotion" of Pluto was in some way a politically-motivated expression of anti-American sentiment. It should be kept in mind that of the 2399 attendees of the IAU meeting, 544 (23%) were from the United States. So during the GA vote, I suspect that roughly one-quarter of the voters were from the United States; and nearly every U.S. astronomer that I talked to after the vote (whom I asked) said that they had voted in favor of Resolution 5A. While the wording of the resolution is not ideal (when is anything from a committee ideal?), it did kill two birds with one stone: it corrected what many people considered to be a seven-decade-old mistake in calling Pluto a planet, and it made a new category ("dwarf planet") to elevate the status of the largest of the "small" solar system bodies.

In early September 2006, Pluto was assigned an asteroid number (134340) by the Minor Planet Center across the street. It is not even a nice number with a lot of zeroes in it, like 20000 Varuna. Prisoners and bank customers get numbers like 134340, not a continent-sized world with its own atmosphere, seasons, and

moons ("continent" - another undefined term!). The object 2003 UB313, nicknamed "Xena", was officially named 136199 Eris. Eris is the Greek goddess of chaos and discord. Looking down at the flawed mortals in Prague, she must have had a hearty laugh at the process that went into the naming of the object that now bears her name.

Eric Mamajek attended AAAP meetings in the early 1990s, graduated Bethel Park H.S. in 1993, and Penn State in 1998. He received a Ph.D. in astronomy from University of Arizona in 2004, and is currently a Clay Postdoctoral Fellow at the Harvard-Smithsonian Center for Astrophysics in Cambridge, MA.

## Pluto Opinions

*Rowen Poole:* Ceres would be the sixth planet, not the fifth, if we went by "classical" definitions - which defines a moon as anything under 1/4 the size of the parent body it orbits. Since our moon is slightly larger than 1/4 the size of the Earth, we are - by technical definition - a double planet system. This makes Mars planet #5 and Ceres #6. Personally, you have to draw a line somewhere. Pluto should retain its planet status if for nothing other than historical value. Anything larger than Pluto found henceforth should be given planet status. Anything closer to the sun than Pluto (Ceres etc) should remain as it is (unless something is found that is larger than Pluto). Pluto has moons. What, three now? So it could be defined as a planet. Then again, asteroids with moonlets are not completely uncommon either. Hmmmm....

*Joe Armata:* Personally, I think Pluto should remain a "planet" for historical reasons, but we draw the line at adding any more planets. Pluto can be designated a pluton as well. Any future discoveries, including Xena, should only be called plutons. What do others think?

*John Cheng:* I could be wrong, but if Pluto were discovered today, it probably would be classified as a Kuiper Belt object and the issue would be finished. This "adjustment" makes things more convoluted...Ceres is now the fifth planet and Charon a "moon" is in!!!! I think the IAU is going to extreme lengths to avoid angering the "Pluto is a planet" contingent....wonder who they could be? Just an opinion....

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- ☀ General Assoc. Meeting October 13
- ☀ SSP Joint Meeting October 18 5:30 p.m.
- ☀ Wagman Star Party October 14 & 28
- ☀ Moraine State Park October 14
- ☀ Mingo Star Party October 21
- ☀ Mercury Transit November 8
- ☀ AAAP Christmas Party December 8
- ☀ Wagman Picnic June 9, 2007

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